



SEQUENCE LISTING

<110> De Buyt, Eric
Lahaye, Andree
Ledoux, Pierre
Detroz, Rene

<120> Xylanase, Microorganisms Producing it,
DNA Molecules, Methods for Preparing this Xylanase and Uses
of the Latter

<130> GC450-D1-US

<140> US 09/909,207

<141> 2001-07-19

<150> US 08/470,953

<151> 1995-06-06

<150> BE 09500448

<151> 1995-05-17

<150> BE 09400706

<151> 1994-07-26

<160> 29

<170> FastSEQ for Windows Version 4.0

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<211> 663

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<213> Bacillus sp.

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caacaagttg	gtaacatgtc	cataaactac	ggagccaact	tccaaccaa	tggtaatgcg	240
tatttatgcg	tctatggttg	gactgttgac	cctcttgtcg	aatattatat	tgctgacagt	300
tggggcaact	ggcgtccacc	aggagcaacg	cctaagggga	ccatcactgt	tgatggagga	360
acatatgata	tctacgagac	tcttagagtc	aatcaaccct	ccattaaggg	gattgccaca	420
tttaaacaat	attggagtgt	tcgaagatcg	aaacgcacga	gtggcacgat	ttctgtcagc	480
aaccacttta	gagcgtggga	aaacttaggg	atgaatatgg	ggaaaatgta	tgaagtcgcg	540
cttactgtag	aaggctatca	aagtagcgga	agtgctaata	tatatagcaa	tacactaaga	600
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<211> 663

<212> DNA

<213> Bacillus sp.

<220>

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<222> (1)...(663)

<221> mat_peptide

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gaa ttt tgg aaa gat agc ggt ggc tct ggg aca atg att ctc aat cat	96
Glu Phe Trp Lys Asp Ser Gly Gly Ser Gly Thr Met Ile Leu Asn His	
20 25 30	
ggc ggt acg ttc agt gcc caa tgg aac aat gtt aac aac ata tta ttc	144
Gly Gly Thr Phe Ser Ala Gln Trp Asn Asn Val Asn Asn Ile Leu Phe	
35 40 45	
cgt aaa ggt aaa aaa ttc aat gaa aca caa aca cac caa caa gtt ggt	192
Arg Lys Gly Lys Lys Phe Asn Glu Thr Gln Thr His Gln Gln Val Gly	
50 55 60	
aac atg tcc ata aac tac gga gcc aac ttc caa cca aat ggt aat gcg	240
Asn Met Ser Ile Asn Tyr Gly Ala Asn Phe Gln Pro Asn Gly Asn Ala	
65 70 75 80	
tat tta tgc gtc tat ggt tgg act gtt gac cct ctt gtc gaa tat tat	288
Tyr Leu Cys Val Tyr Gly Trp Thr Val Asp Pro Leu Val Glu Tyr Tyr	
85 90 95	
att gtc gac agt tgg ggc aac tgg cgt cca cca gga gca acg cct aag	336
Ile Val Asp Ser Trp Gly Asn Trp Arg Pro Pro Gly Ala Thr Pro Lys	
100 105 110	
ggg acc atc act gtt gat gga gga aca tat gat atc tac gag act ctt	384
Gly Thr Ile Thr Val Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Leu	
115 120 125	
aga gtc aat caa ccc tcc att aag ggg att gcc aca ttt aaa caa tat	432
Arg Val Asn Gln Pro Ser Ile Lys Gly Ile Ala Thr Phe Lys Gln Tyr	
130 135 140	
tgg agt gtt cga aga tgc aaa cgc acg agt ggc acg att tct gtc agc	480
Trp Ser Val Arg Arg Ser Lys Arg Thr Ser Gly Thr Ile Ser Val Ser	
145 150 155 160	
aac cac ttt aga gcg tgg gaa aac tta ggg atg aat atg ggg aaa atg	528
Asn His Phe Arg Ala Trp Glu Asn Leu Gly Met Asn Met Gly Lys Met	
165 170 175	
tat gaa gtc gcg ctt act gta gaa ggc tat caa agt agc gga agt gct	576
Tyr Glu Val Ala Leu Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala	
180 185 190	
aat gta tat agc aat aca cta aga att aac ggt aac cct ctc tca act	624
Asn Val Tyr Ser Asn Thr Leu Arg Ile Asn Gly Asn Pro Leu Ser Thr	
195 200 205	

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 210 215 220

663

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 <212> PRT
 <213> Bacillus sp.

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 35 40 45
 Arg Lys Gly Lys Lys Phe Asn Glu Thr Gln Thr His Gln Gln Val Gly
 50 55 60
 Asn Met Ser Ile Asn Tyr Gly Ala Asn Phe Gln Pro Asn Gly Asn Ala
 65 70 75 80
 Tyr Leu Cys Val Tyr Gly Trp Thr Val Asp Pro Leu Val Glu Tyr Tyr
 85 90 95
 Ile Val Asp Ser Trp Gly Asn Trp Arg Pro Pro Gly Ala Thr Pro Lys
 100 105 110
 Gly Thr Ile Thr Val Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Leu
 115 120 125
 Arg Val Asn Gln Pro Ser Ile Lys Gly Ile Ala Thr Phe Lys Gln Tyr
 130 135 140
 Trp Ser Val Arg Arg Ser Lys Arg Thr Ser Gly Thr Ile Ser Val Ser
 145 150 155 160
 Asn His Phe Arg Ala Trp Glu Asn Leu Gly Met Asn Met Gly Lys Met
 165 170 175
 Tyr Glu Val Ala Leu Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala
 180 185 190
 Asn Val Tyr Ser Asn Thr Leu Arg Ile Asn Gly Asn Pro Leu Ser Thr
 195 200 205
 Ile Ser Asn Asp Glu Ser Ile Thr Leu Asp Lys Asn Asn
 210 215 220

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 <213> Bacillus sp.

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 tatgattatg aatttttgaa agatagcggg ggctctggga caatgattct caatcatggc 180
 ggtacgttca gtgccaatg gaacaatgtt aacaacatat tattccgtaa aggtaaaaaa 240
 ttcaatgaaa cacaaacaca ccaacaagtt ggtaacatgt ccataaacta cggagccaac 300
 ttccaaccaa atggtaatgc gtattttatgc gtctatgggt ggactgttga ccctcttgtc 360
 gaattattata ttgtcgacag ttgggggcaac tggcggtccac caggagcaac gcctaagggg 420
 accatcactg ttgatggagg aacatatgat atctacgaga ctcttagagt caatcaaccc 480
 tccattaagg ggattgccac atttaaaciaa tattggagtg ttcgaagatc gaaacgcacg 540
 agtggcacga tttctgtcag caaccacttt agagcgtggg aaaacttagg gatgaatatg 600
 gggaaaatgt atgaagtcgc gcttactgta gaaggctatc aaagtagcgg aagtgtctaat 660

gtatatagca atacactaag aattaacggt aaccctctct caactattag taatgacgag 720
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 <212> DNA
 <213> Bacillus sp.

<220>
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 <222> (1)...(744)

<221> mat_peptide
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<221> sig_peptide
 <222> (82)...(744)

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 Met Arg Gln Lys Lys Leu Thr Leu Ile Leu Ala Phe Leu Val Cys Phe
 1 5 10 15

gca cta acc tta cct gca gaa ata att cag gca caa atc gtc acc gac 96
 Ala Leu Thr Leu Pro Ala Glu Ile Ile Gln Ala Gln Ile Val Thr Asp
 20 25 30

aat tcc att ggc aac cac gat ggc tat gat tat gaa ttt tgg aaa gat 144
 Asn Ser Ile Gly Asn His Asp Gly Tyr Asp Tyr Glu Phe Trp Lys Asp
 35 40 45

agc ggt ggc tct ggg aca atg att ctc aat cat ggc ggt acg ttc agt 192
 Ser Gly Gly Ser Gly Thr Met Ile Leu Asn His Gly Gly Thr Phe Ser
 50 55 60

gcc caa tgg aac aat gtt aac aac ata tta ttc cgt aaa ggt aaa aaa 240
 Ala Gln Trp Asn Asn Val Asn Asn Ile Leu Phe Arg Lys Gly Lys Lys
 65 70 75 80

ttc aat gaa aca caa aca cac caa caa gtt ggt aac atg tcc ata aac 288
 Phe Asn Glu Thr Gln Thr His Gln Gln Val Gly Asn Met Ser Ile Asn
 85 90 95

tac gga gcc aac ttc caa cca aat ggt aat gcg tat tta tgc gtc tat 336
 Tyr Gly Ala Asn Phe Gln Pro Asn Gly Asn Ala Tyr Leu Cys Val Tyr
 100 105 110

ggt tgg act gtt gac cct ctt gtc gaa tat tat att gtc gac agt tgg 384
 Gly Trp Thr Val Asp Pro Leu Val Glu Tyr Tyr Ile Val Asp Ser Trp
 115 120 125

ggc aac tgg cgt cca cca gga gca acg cct aag ggg acc atc act gtt 432
 Gly Asn Trp Arg Pro Pro Gly Ala Thr Pro Lys Gly Thr Ile Thr Val
 130 135 140

gat gga gga aca tat gat atc tac gag act ctt aga gtc aat caa ccc 480
 Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Leu Arg Val Asn Gln Pro

145	150	155	160	
tcc att aag ggg att gcc aca ttt aaa caa tat tgg agt gtt cga aga				528
Ser Ile Lys Gly Ile Ala Thr Phe Lys Gln Tyr Trp Ser Val Arg Arg	165	170	175	
tcg aaa cgc acg agt ggc acg att tct gtc agc aac cac ttt aga gcg				576
Ser Lys Arg Thr Ser Gly Thr Ile Ser Val Ser Asn His Phe Arg Ala	180	185	190	
tgg gaa aac tta ggg atg aat atg ggg aaa atg tat gaa gtc gcg ctt				624
Trp Glu Asn Leu Gly Met Asn Met Gly Lys Met Tyr Glu Val Ala Leu	195	200	205	
act gta gaa ggc tat caa agt agc gga agt gct aat gta tat agc aat				672
Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala Asn Val Tyr Ser Asn	210	215	220	
aca cta aga att aac ggt aac cct ctc tca act att agt aat gac gag				720
Thr Leu Arg Ile Asn Gly Asn Pro Leu Ser Thr Ile Ser Asn Asp Glu	225	230	235	240
agc ata act ttg gat aaa aac aat				744
Ser Ile Thr Leu Asp Lys Asn Asn	245			

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<211> 248

<212> PRT

<213> Bacillus sp.

<400> 6

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20	25	30		
Asn Ser Ile Gly Asn His Asp Gly Tyr Asp Tyr Glu Phe Trp Lys Asp				
35	40	45		
Ser Gly Gly Ser Gly Thr Met Ile Leu Asn His Gly Gly Thr Phe Ser				
50	55	60		
Ala Gln Trp Asn Asn Val Asn Asn Ile Leu Phe Arg Lys Gly Lys Lys				
65	70	75	80	
Phe Asn Glu Thr Gln Thr His Gln Gln Val Gly Asn Met Ser Ile Asn				
85	90	95		
Tyr Gly Ala Asn Phe Gln Pro Asn Gly Asn Ala Tyr Leu Cys Val Tyr				
100	105	110		
Gly Trp Thr Val Asp Pro Leu Val Glu Tyr Tyr Ile Val Asp Ser Trp				
115	120	125		
Gly Asn Trp Arg Pro Pro Gly Ala Thr Pro Lys Gly Thr Ile Thr Val				
130	135	140		
Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Leu Arg Val Asn Gln Pro				
145	150	155	160	
Ser Ile Lys Gly Ile Ala Thr Phe Lys Gln Tyr Trp Ser Val Arg Arg				
165	170	175		
Ser Lys Arg Thr Ser Gly Thr Ile Ser Val Ser Asn His Phe Arg Ala				
180	185	190		

Trp Glu Asn Leu Gly Met Asn Met Gly Lys Met Tyr Glu Val Ala Leu
 195 200 205
 Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala Asn Val Tyr Ser Asn
 210 215 220
 Thr Leu Arg Ile Asn Gly Asn Pro Leu Ser Thr Ile Ser Asn Asp Glu
 225 230 235 240
 Ser Ile Thr Leu Asp Lys Asn Asn
 245

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 <213> Bacillus sp.

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 <212> DNA
 <213> Bacillus sp.

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 <222> (1)...(81)

<221> sig_peptide
 <222> (1)...(81)

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 gca cta acc tta cct gca gaa ata att cag gca 81
 Ala Leu Thr Leu Pro Ala Glu Ile Ile Gln Ala
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<210> 9
 <211> 27
 <212> PRT
 <213> Bacillus sp.

<400> 9
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 1 5 10 15
 Ala Leu Thr Leu Pro Ala Glu Ile Ile Gln Ala
 20 25

<210> 10
 <211> 1513
 <212> DNA
 <213> Bacillus sp.

<400> 10

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ataggaactt	tcccatttgc	aagacgataa	aaaatctttt	tcccctat	tatcttatcg	180
ccttgatcgg	tttaatttgt	aaactttatt	ttagtttacg	tgatgttccc	tcattcatac	240
cattaatcac	agttaacgct	agagtcac	tttttcggtt	ctcaaaaata	cctgaagaac	300
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aatgattctc	aatcatggcg	gtacgttcag	tgcccaatgg	aacaatgtta	acaacatatt	840
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<210> 11
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 <212> DNA
 <213> Bacillus sp.

<220>
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 <222> (620)...(1363)

<221> mat_peptide
 <222> (701)...(1363)

<221> sig_peptide
 <222> (620)...(700)

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ataggaactt	tcccatttgc	aagacgataa	aaaatctttt	tcccctat	tatcttatcg	180
ccttgatcgg	tttaatttgt	aaactttatt	ttagtttacg	tgatgttccc	tcattcatac	240
cattaatcac	agttaacgct	agagtcac	tttttcggtt	ctcaaaaata	cctgaagaac	300
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ctgtgaaagg	agggtaggt	gtaccgtaga	cttcattacc	aaaaattagt	tgtaaaaaaa	600
ttaaaaggag	gaatgccta	atg aga caa	aag aaa ttg	acg ttg att	tta gcc	652
		Met Arg Gln	Lys Lys Leu	Thr Leu Ile	Leu Ala	
		1	5		10	

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caa atc gtc acc gac aat tcc att ggc aac cac gat ggc tat gat tat Gln Ile Val Thr Asp Asn Ser Ile Gly Asn His Asp Gly Tyr Asp Tyr 30 35 40	748
gaa ttt tgg aaa gat agc ggt ggc tct ggg aca atg att ctc aat cat Glu Phe Trp Lys Asp Ser Gly Gly Ser Gly Thr Met Ile Leu Asn His 45 50 55	796
ggc ggt acg ttc agt gcc caa tgg aac aat gtt aac aac ata tta ttc Gly Gly Thr Phe Ser Ala Gln Trp Asn Asn Val Asn Asn Ile Leu Phe 60 65 70 75	844
cgt aaa ggt aaa aaa ttc aat gaa aca caa aca cac caa caa gtt ggt Arg Lys Gly Lys Lys Phe Asn Glu Thr Gln Thr His Gln Gln Val Gly 80 85 90	892
aac atg tcc ata aac tac gga gcc aac ttc caa cca aat ggt aat gcg Asn Met Ser Ile Asn Tyr Gly Ala Asn Phe Gln Pro Asn Gly Asn Ala 95 100 105	940
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aat gta tat agc aat aca cta aga att aac ggt aac cct ctc tca act Asn Val Tyr Ser Asn Thr Leu Arg Ile Asn Gly Asn Pro Leu Ser Thr 220 225 230 235	1324
att agt aat gac gag agc ata act ttg gat aaa aac aat taaaaatcct	1373

Ile Ser Asn Asp Glu Ser Ile Thr Leu Asp Lys Asn Asn
 240 245

tatctctttc gggttcagttc tcattatattt caaataacct cccggttgga tcttttccaa 1433
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 tgaaacacct ccgtcactag 1513

<210> 12
 <211> 619
 <212> DNA
 <213> Bacillus sp.

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 ataggaactt tcccatttgc aagacgataa aaaatctttt tcccctattt tatcttatcg 180
 ccttgatcgg ttttaattgt aaactttatt ttagtttacg tgatgttccc tcattcatac 240
 cattaatcac agttaacgct agagtcactt tttttcgggt ctcaaaaata cctgaagaac 300
 atttatgtca ttttttctca cgccgctcca taatggaata tatatactct tttatacata 360
 ttaagtaaatt tagtatatac ttgcgttatc aaaatgtgag ataactaat tgatcaaaca 420
 agcagctatc caaaaaacac tgatgttgac ctcttaaaga agtgtcacta tctatgaaaa 480
 gataattatc cagtttcaaa atttgaaata gtgtgtatgg aatagtttga atgtcaactg 540
 ctgtgaaagg agggtaggta gtaccgtaga cttcattacc aaaaattagt tgtaaaaaaa 600
 ttaaaaggag gaatgccta 619

<210> 13
 <211> 150
 <212> DNA
 <213> Bacillus sp.

<400> 13
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 tcttttccaa cgggaggttt tattggaaag gttaagtata gtatactccg attccatcca 120
 gaggaatgct tgaaacacct ccgtcactag 150

<210> 14
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic oligonucleotide

<400> 14
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<210> 15
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic oligonucleotide

<400> 15
 cccccctacg taggcggggg cggccgcggt tacctagggc ctctgatac gcctat 56

<210> 16
 <211> 31
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 16
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 <210> 17
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 17
 taccttgtct acaaacccc 19

 <210> 18
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 18
 cggtcgccgc atacacta 18

 <210> 19
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 <212> DNA
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 <400> 19
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 <210> 20
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 <220>
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 <400> 20
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 <210> 21
 <211> 50

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 21
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 <210> 22
 <211> 39
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 22
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 <210> 23
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

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 <210> 24
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 <223> synthetic oligonucleotide

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 <210> 25
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 <213> Artificial Sequence

 <220>
 <223> synthetic oligonucleotide

 <400> 25
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 <210> 26
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 <212> DNA
 <213> Bacillus pumilus

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<220>
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<222> (1)...(185)
<223> n = A,T,C or G

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catccatgcc gggttaaagc agtatcggtc catctaacag agaaggngctg catgaaagga      120
ggatgatgggt ttttcatctt agggatgaca gaacaatacg gatgaaaaaa ggagagggat      180
ggaaa                                           185

<210> 27
<211> 81
<212> DNA
<213> Bacillus pumilus

<400> 27
atgaatttga aaagattgag gctgttggtt gtgatgtgta ttggatttgt gctgacactg      60
acggctgtgc cggctcatgc g                                           81

<210> 28
<211> 81
<212> DNA
<213> Bacillus pumilus

<220>
<221> CDS
<222> (1)...(81)

<400> 28
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  1             5             10             15

gtg ctg aca ctg acg gct gtg ccg gct cat gcg      81
Val Leu Thr Leu Thr Ala Val Pro Ala His Ala
      20             25

<210> 29
<211> 27
<212> PRT
<213> Bacillus pumilus

<400> 29
Met Asn Leu Lys Arg Leu Arg Leu Leu Phe Val Met Cys Ile Gly Phe
  1             5             10             15
Val Leu Thr Leu Thr Ala Val Pro Ala His Ala
      20             25

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